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A1 **APPLICATION FOR PATENT OF INVENTION**  
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(54) Method of producing brushes with a flexible cap and the brushes thus obtained

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The present invention concerns a method of producing brushes with a flexible cap, specifically intended for hair care and currently designated under the name of pneumatic brushes, as well as with the brushes obtained by carrying out this method.

It is known that in these pneumatic brushes the bristle tufts are mounted on a flexible convex cap which is attached at its periphery to a rigid mount which may or may not have a handle, a chamber filled with air being arranged between the said cap and the said mount.

Each bristle tuft is introduced by strong friction into a hole made in the cap and is prevented from escaping towards the outside by the fact that on the back side of this cap it is provided with a clip or when it is composed of synthetic bristles burned so that they partially melt and a ball is formed at its end inside the chamber. Thus, although it can slide with hard friction in its hole, the tuft cannot be easily separated from the cap due to the fact that a clip is used or that a ball is formed at the end. In order to make the sliding of the tufts in their hole even more difficult, it was also considered to glue them on the back face of the cap and/or to reinforce the thickness of the cap, for example by making it from two superimposed caps.

Thus, the sliding of the bristle tufts through the cap is made difficult and its amplitude in the direction of the outside is limited by a stop. However, experience shows that, in spite of the difficulty of sliding, the tufts have a tendency to slide in the direction of the inside of the chamber, a direction where nothing stops them, which shortens their length and modifies their combing action. It may even happen that the interior end of certain tufts will rest against the rigid mount. A brush with the tufts thus moved back may become unusable and evidently, because of the attachment of the cap on the mount, one cannot push the tufts in the opposite direction to make them go back.

The purpose of the present invention is to remedy this disadvantage. According to the invention, the method is concerned with producing a brush in which the bristle tufts traverse a flexible cap attached to a rigid mount and are prevented from separating from the said cap with the aid of stops made near their ends, that are in-between the said cap and the said mount, characterized by the fact that on the face of the said flexible cap directed toward the mount, a flexible sheet is applied which is made in one piece with the cap, imprisoning the said ends of the tufts and their stops between it and the said sheet.

Thus, the said flexible sheet prevents the tufts from sliding in the direction of the mount and thus from entering into the interior of the air chamber.

Preferably, the flexible cap and sheet are made of rubber or an analogous material and their joining is obtained by gluing and/or vulcanization. In order to fill in at least in part the excess thickness due to the said stops, it is advantageous to apply on the corresponding face of the flexible cap, at least one thick layer of vulcanizing glue, which is allowed to dry before fixation of the said flexible sheet, under pressure at a low temperature.

The figures of the attached drawing will provide understanding of how the invention can be realized.

Figure 1 is a perspective view of a brush to which the invention is applied.

Figure 2 is a section along line II – II of Figure 1.

Figures 3 to 6 illustrate the method according to the invention.

The hairbrush 1 according to the invention, shown in Figure 1, has a mount 2 provided with a handle 3. The mount 2 forms a kind of a hollow dish which is closed by a flexible convex cap 5 towards the outside and is supported on the edges of the dish, along which it is attached. Mounting 2 and the flexible cap 5 thus delineate a closed chamber 12, filled with air.

Tufts of bristles 4, arranged in parallel rows traverse the flexible cap 5 through holes 13 in it. The tufts 4 protrude towards the outside of the brush and on the side of chamber 12 are provided with stops 10 that prevent the said tufts from separating from the cap 5 when forces directed towards the outside are applied to them.

On the inside face of cap 5 a flexible sheet 6 is applied and attached which imprisons stops 10. Thus, the tufts 4 can no longer slide in the direction of mount 2. The tufts 4 are thus immobilized in holes 13.

Figure 3 shows that the tufts 4 can, for example, be composed of bristles 7 or 8, each of which forms a loop 9 which rests on the edges of holes 13 on the side of chamber 12. If these bristles are made of a meltable synthetic material, the loops 9 are heated until

they melt to produce a ball which, when cooled will play the role of stop 10 (see Figure 4).

On the inside face of cap 5, one can then deposit at least one layer of vulcanizing glue 11 (see Figure 5). Preferably, the cap 5 is glued as soon as possible after the formation of the balls 10 and it is allowed to dry for several hours. Then a second layer of vulcanizing glue is applied which is also allowed to dry for several hours.

The, on layer 11, a flexible sheet 6 is applied, the face of which directed towards the said layer 11 may be covered with an adhesive (see Figure 6). After heating the said sheet 6 can be made in one piece with cap 5 by applying pressure against it. The balls 10 are then imprisoned between cap 5 and sheet 6. Moreover, their mobility is still further diminished by the presence of the layer or layers of glue and/or adhesive that are between cap 5 and sheet 6.

PATENT CLAIMS

1. Method of producing a brush in which the bristle tufts traverse a flexible cap attached on a rigid mount and are prevented from separating from the said cap with the aid of balls made near their ends comprised between the said cap and the said mount, characterized by the fact that on the face of the said flexible cap directed toward the mount, a flexible sheet is applied which is made into one piece with the cap by imprisoning the said ends of the tufts of their balls between it and the said sheet.
2. Method according to Claim 1, characterized by the fact that the flexible cap and sheet are made of natural or synthetic rubber and that their joining is obtained by gluing.
3. Method according to Claim 1, characterized by the fact that the flexible cap and sheet are made of natural or synthetic rubber and by the fact that their joining is obtained by vulcanization.
4. Method according to Claim 3, characterized by the fact that the vulcanization is performed at a low temperature and under pressure.
5. Method according to any of Claims 1 to 4, for producing a brush, the tufts of which are made of a meltable synthetic material, characterized by the fact that in the known manner the said stops are formed by the ball which is produced during partial fusion of the ends of the bristles.
6. Brush, notably a hair brush, obtained by carrying out the method specified under any of Claims 1 to 5.

